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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/005,000 | 12/07/2001 | James H. Lee | H-204145 | 1829 |

7590 12/16/2003

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EXAMINER

ALEJANDRO, RAYMOND

| ART UNIT | PAPER NUMBER |
|----------|--------------|
|----------|--------------|

1745

DATE MAILED: 12/16/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Applicant(s)

10/005,000

Applicant(s)

LEE ET AL.

Examiner

Raymond Alejandro

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 November 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4,5,7 and 8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1,2,7 and 8 is/are allowed.
- 6) ☒ Claim(s) 4 and 5 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____. 6) ☐ Other: _____

DETAILED ACTION***Response to Amendment***

This paper is submitted in response to the amendment of 11/20/03. The applicants have overcome the objections, the 35 USC 112 rejections, the obviousness-type double patenting rejection, and the 35 USC 102 rejection and 35 USC 103 rejection for certain claims only. However, some claims are still rejected under the same 35 USC 102 rejection and the 35 USC 103 for the reasons of record. Thus, the application is herein finally rejected.

Claim Rejections - 35 USC § 102

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
2. Claim 4 is rejected under 35 U.S.C. 102(b) as being anticipated by Sugita et al 4820594.

The present application is directed to processes wherein the disclosed inventive concept comprises the specific pumping; heating, expanding and energy using/removing steps. Other limitations includes using the shaft work to drive a pump; and the organic based fluid.

With respect to claim 4:

Sugita et al disclose the following (CLAIM 17):

- 17. A method of starting a fuel cell power generation**
55 **system, comprising:**
a first stage including the steps of filling a reforming
part of a reformer with inert gas; and filling a fuel
cell with inert gas, wherein said reformer and said
fuel cell are connected by a pipe line;
60 a second stage including the steps of starting a drive
assembly comprising a compressor, a combustor, a
turbine and a generator by feeding air from said
compressor to said combustor; feeding fuel to said
reformer reforming part and from said reformer
65 reforming part to said combustor; and engaging a
clutch of said drive assembly when said compres-
sor, said turbine and said generator have attained a
predetermined rotating speed;

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- a third stage including the steps of feeding a high-temperature combustion exhaust gas produced by said drive assembly to a waste heat boiler; feeding water to said waste heat boiler; generating steam in said waste heat boiler; and feeding steam generated in said waste heat boiler to said reformer reforming part where it is mixed with fuel fed to said reformer reforming part;
- a fourth stage including the steps of feeding fuel and steam from said reformer reforming part to an anode of said fuel cell; feeding air to a cathode of said fuel cell; and feeding air from said compressor to a reformer combustion part;
- a fifth stage including the steps of elevating the temperature of said anode by elevating the temperature of said fuel and steam fed to said anode from said reformer reforming part, by in turn elevating the temperature of said reformer reforming part by combusting said air fed to said reformer combustion part from said compressor; elevating the tem-

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- perature of said cathode by feeding a high-temperature combustion gas to said cathode from said reformer combustion part and by feeding air to said cathode from said compressor of said drive assembly; recycling a portion of gas exiting said cathode; and feeding a remainder of gas exiting said cathode to said combustor of said drive assembly; and
- a sixth stage including the steps of attaining an operational temperature in said reformer and said fuel cell; reducing said feed of fuel from said reformer reforming part to said combustor of said drive assembly; reducing said feed of air from said compressor to said combustor of said drive assembly; and stopping combustion in said combustor of said drive assembly.
18. A method of starting a fuel cell power generation system according to claim 17, wherein said fuel is natural gas, LPG, methanol or gas oil.

* * * * *

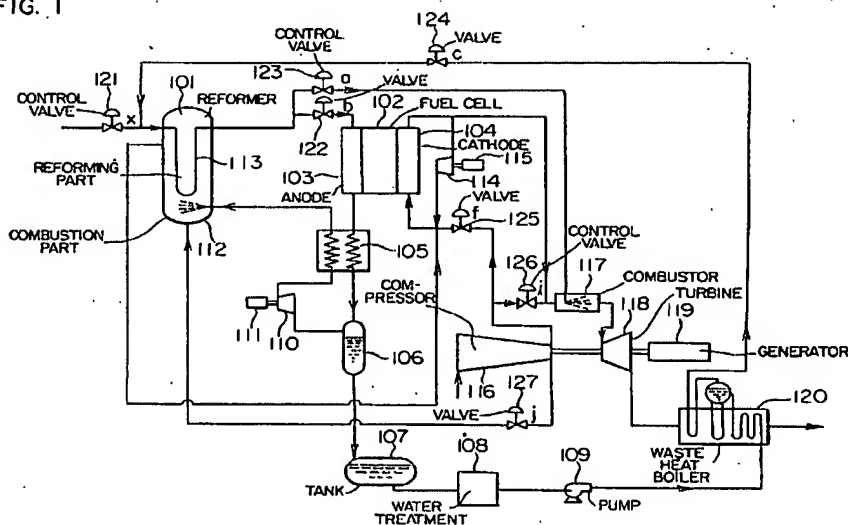
Sugita et al disclose a fuel cell system wherein fuel is used directly as a heating medium for raising the temperature of the system (ABSTRACT). **Figure 1** below shows the fuel cell system comprising a pump 109 which is connected to the waste heat boiler 120 which transfer heat to the water to create steam wherein the heat waster boiler 120 is further connected to the inlet part of the reformer 101 (COL 3, lines 34-42). The fuel cell system comprises the fuel cell 102; the air compressor 116, the turbine 118, the heat boiler 120 (COL 2, lines 53-57).

It is also evident from **Figure 1** that the fuel cell is connected to an expander (turbine 118), thereby delivering the exhaust to the expander. The compressor 116, the turbine 118 and generator 119 are connected with the same power system which is further connected through a clutch with a drive assembly to deliver work (COL 3, lines 14-22). Figure 1 also depicts that the expander is connected to another fuel cell component to use the generated work.

Figure 1 also illustrates that the expander (turbine 118) is in flow communication (connected) with fuel cell through the reformer 101 wherein the fuel cell anode outlet is

connected to the heat exchanger 105 and the outlet of heat exchanger is connected to the drum 106 (COL 3, lines 1-11) where they cool the anode outlet exhaust (COL 5, lines 1-10). Thus, both the heat exchanger 105 and the drum 106 act as a condenser by recovering constituent of the anode gas exhaust. Thereafter, the separated water enters water tank 107, then brought to elevated pressure and sent to the waste heat boiler 102 by means of the feed water pump 109 (COL 5, lines 55-62).

FIG. 1



It is also disclosed that the fuel is directly used as heating medium (ABSTRACT/COL 1, lines 59-65) wherein the fuel includes at least methanol, LPG and gas oil (CLAIM 18):

18. A method of starting a fuel cell power generation system according to claim 17, wherein said fuel is natural gas, LPG, methanol or gas oil.

* * * * *

Thus, the claim is anticipated.

Claim Rejections - 35 USC § 103

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sugita et al 4820594 as applied to claim 4 above, and further in view of LaPierre et al 6348278.

Sugita et al are applied, argued and incorporated herein for the reasons above. However, Sugita et al do not disclose using the shaft work to drive a pump.

LaPierre et al disclose that in addition to using the heat released in cooling streams and combusting the exhaust tail gas stream 48, it is possible to use the energy of expanding gases to operate other devices in the system such as pumps, turbines or blowers (COL 15, lines 34-50). Particularly, the energy from the combustion exhaust gas expander 130 could also be used to operate pumps (COL 15, lines 43-45). La Pierre et al teach that the their integrated system is also particularly suited for starting-up fuel cell systems (COL 16, lines 12-20).

In view of the above, it would have been obvious to one skilled in the art at the time the invention was made to use the shaft work to drive a pump of LaPierre et al in the fuel cell system of Sugita et al as LaPierre et al disclose that in addition to using the heat released in cooling streams and combusting the exhaust tail gas stream, it is possible to use the energy of expanding gases to operate other devices in the system such as pumps, turbines or blowers. Thus, an energy efficient system is obtained because the energy from the combustion exhaust gas expander is fully utilized to operate additional-ancillary devices for supporting fuel cell operations which are necessary to convert chemical energy of a reaction into electrical energy. *Furthermore, it is noted that LaPierre et al clearly envision to use the foregoing shaft work during start-up*

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conditions as La Pierre et al teach that the their integrated system is also particularly suited for starting-up fuel cell systems.

Allowable Subject Matter

5. The following is a statement of reasons for the indication of allowable subject matter:
refer to the amendment dated 11/20/03.
6. Claims 1-2 and 7-8 are allowed.

Response to Arguments

7. Applicant's arguments filed 11/20/03 have been fully considered but they are not persuasive. Since claims 1-2 and 7-8 have been found allowable, the examiner is only addressing applicants' argument with respect to claims 4-5. In that, it is noted that the most important line of reasoning of applicants' argument is grounded on the allegation that the prior art of record does "not meet the recited limitation of heating the organic based liquid working fluid to a gas using a heating source comprising a fuel cell stack". However, it is further noted that the instant claims are silent to this specific limitation, and therefore, they are not commensurate to the argued language.
8. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (*i.e.*, "*heating the organic based liquid working fluid to a gas using a heating source comprising a fuel cell stack*") are not recited in the rejected claim(s). Although the claims are interpreted in light of the

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specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Raymond Alejandro whose telephone number is (703) 306-3326. The examiner can normally be reached on Monday-Thursday (8:30 am - 7:00 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on (703) 308-2383. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Raymond Alejandro
Examiner
Art Unit 1745


STEPHEN KALAFUT
PRIMARY EXAMINER
GROUP 1200